CLAIMS

What is claimed is:

1. A process comprising:

forming a metal interconnect structure onto a substrate;

forming a carbon-doped oxide (CDO) layer with a first concentration of carbon dopants therein; and

continuing to form said CDO layer further with a second concentration of carbon dopants therein, wherein the first concentration is different than the second concentration.

2. The process according to Claim 1 further comprising:

forming the CDO layer further with a third concentration of carbon dopants therein, wherein there is a linear correlation of the concentration of carbon dopants between the first concentration, the second concentration, and the third concentration.

3. The process according to Claim 1 further comprising:

forming the CDO layer further with a third concentration of carbon dopants therein, wherein there is a concave nonlinear correlation between the first concentration, the second concentration, and the third concentration.

4. The process according to Claim 1 further comprising:

forming the CDO layer further with a third concentration of carbon dopants therein, wherein there is a convex nonlinear correlation between the first concentration, the second concentration, and the third concentration.

5. The process according to Claim 1 wherein said first concentration is higher than said second concentration.

6. A process according to Claim 1 wherein said first concentration is lower than said second concentration.

7. A process comprising:

forming a carbon-doped oxide (CDO) layer with a first concentration of carbon dopants therein; and

continuing to form said CDO layer further with a second concentration of carbon dopants therein, wherein the first concentration is different than the second concentration.

8. The process according to Claim 7 further comprising:

forming the CDO layer further with a third concentration of carbon dopants therein, wherein there is a linear correlation between the first concentration, the second concentration, and the third concentration.

9. The process according to Claim 7 further comprising:

forming the CDO layer further with a third concentration of carbon dopants therein, wherein there is a concave nonlinear correlation between the first concentration, the second concentration, and the third concentration.

10. The process according to Claim 7 further comprising:

forming the CDO layer further with a third concentration of carbon dopants therein, wherein there is a convex nonlinear correlation between the first concentration, the second concentration, and the third concentration.

11. The process according to Claim 7 wherein said first concentration is higher than said second concentration.

12. The process according to Claim 7 wherein said first concentration is lower than said second concentration.

13. An interlayer dielectric comprising:

a carbon-doped oxide (CDO) layer having a first region with a first concentration of carbon dopants therein and a second region having a second concentration of carbon dopants therein, wherein the first concentration is different than the second concentration.

14. The interlayer dielectric of Claim 15 further wherein said CDO layer has a third region with a third concentration of carbon dopants therein, wherein there is a linear correlation between the first concentration, the second concentration, and the third concentration.

15. The interlayer dielectric of Claim 15 further wherein said CDO layer has a third region with a third concentration of carbon dopants therein, wherein there is a concave nonlinear correlation between the first concentration, the second concentration, and the third concentration.

16. The interlayer dielectric of Claim 15 further wherein said CDO layer has a third region with a third concentration of carbon dopants therein, wherein there is a convex nonlinear correlation between the first concentration, the second concentration, and the third concentration.

17. The interlayer dielectric of Claim 13 further wherein first concentration is higher than said second concentration.

18. The interlayer dielectric of Claim 13 further wherein first concentration is lower than said second concentration.

22. A semiconductor structure comprising:

a carbon-doped oxide (CDO) layer having a first region with a first concentration of carbon dopants therein and a second region having a second concentration of carbon dopants therein, said CDO layer having a dual damascene structure formed therein; and

a conductive layer formed within said dual damascene structure, said conductive layer having a via portion and a metal interconnect portion, wherein the first region is disposed proximal to said metal interconnect portion and said second region is disposed proximal to said via portion, said first concentration larger than said second concentration.

23. The structure of Claim 22 further wherein said CDO layer has a third region with a third concentration of carbon dopants therein, wherein there is a linear correlation between the first concentration, the second concentration, and the third concentration.

24. The structure of Claim 22 further wherein said CDO layer has a third region with a third concentration of carbon dopants therein, wherein there is a concave nonlinear correlation between the first concentration, the second concentration, and the third concentration.

25. The structure of Claim 22 further wherein said CDO layer has a third region with a third concentration of carbon dopants therein, wherein there is a convex nonlinear correlation between the first concentration, the second concentration, and the third concentration.

26. The structure of Claim 22 further wherein said CDO layer has a third region with a third concentration of carbon dopants therein and a fourth region with a fourth concentration of carbon dopants therein, wherein there is a convex nonlinear correlation between the first concentration, the second concentration, the third concentration, and the fourth concentration.